REMARKS

In the Office action mailed December 23, 2008, claims 1 and 3-4 were rejected under 35 USC §112, first paragraph for allegedly failing to comply with the written description requirement.

Claims 1 and 3-4 were rejected under §103(a) for allegedly being obvious over JP 2002-012990 and further in view of US Patent 5,211,663 to Kovacs.

Claims 5-8 were rejected under 35 USC §103 for allegedly being obvious over US 2003/0162077 to Ohtani et al. in view of US Patent 6,440,598 to Fukui et al., and further in view of the '663 patent to Kovacs et al.

Claim 9 was rejected under 35 USC §103 for allegedly being obvious over the '077 document to Ohtani in view of the '598 patent to Fukui and the '663 patent to Kovacs, and further in view of US Patent 4,497,667 to Vashi.

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and the following explanations are provided to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 1 and 3-9 are presented for the Examiner's consideration.

A. Rejection of Claims 1 and 3-4 Under 35 USC §112, First Paragraph Must be Withdrawn

These claims were rejected for allegedly failing to comply with the written description requirement of §112, first paragraph. Specifically, the Examiner asserted that the term "external air" recited in claim 1, is not supported by the application as originally filed. It is respectfully submitted that upon closer review, the Examiner will agree that such term is adequately supported.

An operation of "air bubbling" according to the present invention increases the amount of dissolved oxygen in the process liquid (alkaline solution) 12. Furthermore, as a result of air bubbling, a reaction proceeds in the process liquid 12, in which carbon dioxide changes to carbonate ion, as shown in expressions (d) and (e) on page 13 of the specification. This means that external air which is supplied into the process liquid 12 promotes further dissolving of oxygen and carbon dioxide into the process liquid. In sharp contrast, "cavitation" which forms air bubbles in a liquid does not involve an increase in the amount of dissolved oxygen or carbon dioxide in the liquid.

Claim 1 previously recited an operation of "air bubbling the alkaline solution..." Claim 1 was previously amended to recite "air bubbling external air into the alkaline solution..." The specification of the present application defines air bubbling as, "[a]ir bubbling means blowing air into the process liquid 12 to increase the amount of dissolved oxygen in the process liquid 12 and thereby promote hydroxide formation." See p. 12, lines 19-21.

The previous amendment to claim 1 specifies that the air is bubbled into the alkaline solution. This aspect is expressly noted in the description of "air bubbling." Hence, the air, prior to bubbling, is external to the alkaline solution.

As previously explained in Response B (see page 6), this amendment was presented to further distinguish the claims from the JP '990 document which describes cavitation. This is explained in section B. herein.

The term "external" does not designate any particular air type or air source. Instead, that term merely clarifies that the air which is bubbled into the process liquid 12 is air that is external to the process liquid as opposed to a cavitation scenario in

which gases may originate from the process liquid itself. Hence, the term "external" is used. A full reading of the present application and review of the accompanying patent figures confirms this.

It is respectfully submitted that the phrase "external air into" in claim 1 is adequately supported by the originally filed application, and particularly by the passage at p. 12, lines 19-21 set forth above. That passage describes in part, "blowing air into the process liquid 12." The term "air into" supports the claim term "external air into." As explained, the air that is bubbled into the liquid is air external to the liquid.

Furthermore, the law is well established that adequate written description support under §112 does not require literal support or identical language in the specification. Instead, the standard for determining compliance with the written description requirement is, "whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter." *In re Kaslow*, 707 F.2d 1366, 217 USPQ 1089 (Fed. Cir. 1983). "It is not necessary that the claimed subject matter be described identically." *In re Wilder*, 736 F.2d 1516, 222 USPQ 369 (Fed. Cir. 1984). "It is not necessary that the application describe the claim limitations in greater detail than the invention warrants." *Martin v. Mayer*, 823 F.2d 500, 3 USPQ2d 1333 (Fed. Cir. 1987). "The prior application need not describe the claimed subject matter in exactly the same terms as used in the claims." *Koito Manufacturing Co., Ltd. v. Turn-Key-Tech, LLC*, 381 F.3d 1142 (Fed. Cir. 2004).

Therefore and in summary, it is respectfully submitted that upon further consideration, the Examiner will agree that the previously submitted amendment to claim 1 is in fact adequately supported by the application as originally filed.

For at least these reasons, it is submitted that the rejection under §112, first paragraph, be withdrawn.

B. Rejection of Claims 1 and 3-4 Under 35 USC §103 Based on JP 2002-012990 in View of US Patent 5,211,663 to Kovacs Must be Withdrawn

Independent claim 1 recites a method for forming a passive film on a surface of a stainless steel member. The method calls for immersing the stainless steel member in an alkaline solution of pH 9 to 12 at 40 to 60°C. The method also recites air bubbling the alkaline solution, added with a pH buffer, or provided with a pH buffer action. Claim 1 additionally recites that the amount of oxygen dissolved in the alkaline solution is increased to promote the formation of hydroxides constituting the passive film. Claim 1 additionally recites that as a result of carbon dioxides dissolving in the alkaline solution, falling of the solution pH is suppressed. Claim 1 continues and recites that the hydroxides constituting the passive film are produced from metal ions constituting the stainless steel and hydroxide ions.

Specifically, claim 1 requires an operation of "air bubbling."

In sharp contrast, the JP '990 document utilizes an entirely different phenomenon for inhibiting corrosion on a metal workpiece, i.e. through the use of cavitation. Cavitation does not involve introducing additional amounts of air into a liquid as recited in claim 1. Instead, cavitation is the phenomenon of formation of vapor bubbles in a flowing liquid in a region where the pressure of the liquid falls

below its vapor pressure. Cavitation typically occurs in a liquid immediately behind the blade of a rotating propeller, for example.

In order to further distinguish the claimed subject matter of claim 1 from the cited JP '990 document, claim 1 was previously amended to specifically recite that air, external to the process liquid, is bubbled into the alkaline solution. This clearly distinguishes claim 1 from the JP '990 document.

Therefore, the JP '990 document does not describe "air bubbling" in which external air is blown into the process liquid. Instead, the JP '990 document describes cavitation, which is an entirely different phenomenon. In fact, if one followed the teachings of the JP '990 document, one would be led away from the process of the present invention. As previously explained, cavitation forms vapor bubbles in a liquid by reducing the pressure in a region of the liquid, hence there is no need to introduce air external to the liquid. An artisan following the teachings of the JP '990 document would not be motivated to configure a source of pressurized air or employ an air pump in order to blow external air into a process liquid. "[A]n applicant may rebut a prima facie case of obviousness by showing that the prior art teaches away from the claimed invention in any material respect." *In re Peterson*, 315 F.3d 1325, 65 USPQ2d 1379 (Fed. Cir. 2003).

For at least these reasons, it is submitted that the Examiner will appreciate that the rejection based upon the JP '990 document is deficient and should be withdrawn.

The JP '990 document describes a passivation method for treating a metal workpiece to improve corrosion resistance, wherein the metal workpiece is immersed in an alkaline passivation solution containing alkaline additives. Air

bubbles are generated by a water jet or an ultrasonic wave in the alkaline passivation solution, and the pH of the passivation solution is controlled.

Kovacs teaches a passivation method for treating metal surfaces. Kovacs further teaches that the passivation solution may be oxygenated by bubbling with air or oxygen to improve the passivation process. Kovacs also teaches that the passivation temperature is 20 to 50°C.

In rejecting claim 1, the Examiner contends that one of ordinary skill in the art would have found it obvious to have substituted the cavitation air bubbling generation technique as taught by JP '990 with air or oxygen bubbling technique as taught by Kovacs.

Applicant respectfully disagrees with the Examiner's contention. As explained above, the "air bubbling" of the present invention increases the amount of dissolved oxygen in the process liquid, whereas the cavitation air bubbling technique of JP '990 does not increase the amount of dissolved oxygen in a liquid because air bubbles are generated by cavitation occurring in the liquid. Thus, from a technical point of view, the air bubbling technique of the present invention and that of JP '990 are totally different from one another.

Furthermore, the Applicant traverses the Examiner's contention that one of ordinary skill in the art would have found it obvious to have substituted the cavitation air bubbling generation technique as taught by JP '990 with air or oxygen bubbling technique as taught by Kovacs. According to the invention described in JP '990, air bubbles generated by cavitation occurring in a liquid are forced against a surface of a workpiece to perform a corrosion resistant treatment on the workpiece (paragraph [0008]). In the invention shown in JP '990, the air bubbles generated by cavitation is

an essential feature or requirement for achieving a prescribed advantageous effect (claims 1-9, paragraphs [0008] – [0009]). Accordingly, if the cavitation air bubbling technique as taught by JP '990 were replaced with the air or oxygen bubbling technique as taught by Kovacs as attempted by the Examiner, the attempted replacement would have failed to achieve the prescribed advantageous effect of the JP '990 invention. It appears clear that replacing the cavitation air bubbling technique of JP '990 with the air or oxygen bubbling technique of Kovacs is an impossible option for one having ordinary skill in the art.

It is acknowledged that Kovacs teaches that the passivation solution may be oxygenated by bubbling with air or oxygen to improve the passivation process (col. 5, lines 52-54). Kovacs teaches that air bubbling is achieved only in conjunction with preparation of a passivation solution. There is no disclosure or teaching in Kovacs that bubbling is achieved during passivation treatment.

It is respectfully submitted that the invention as recited in claim 1 is not rendered obvious over JP '990 in view of Kovacs.

For at least these reasons, it is submitted that independent claim 1 is patentable over the limited teachings of the JP '990 document and the '663 patent to Kovacs. Since claim 1 is patentable over the cited art, so too are claims 3 and 4 dependent therefrom.

C. Rejection of Claims 5-8 Under 35 USC §103 Based on US 2003/0162077 to Ohtani in View of US Patent 6,440,598 to Fukui, and Further in View of the '663 Patent to Kovacs et al. Must be Withdrawn

Independent claim 5 recites a method for manufacturing a stainless steel separator for use in a fuel cell. The method comprises applying a lubricant to a

stainless steel thin sheet and press-forming gas flow passages and cooling water flow passages in the sheet. Lubricant adhered to the stainless steel thin sheet is removed by spraying the sheet with an alkaline solution for cleaning. The alkaline solution is removed from the stainless steel thin sheet by spraying washing water onto the sheet. Wash water is removed by spraying ion-exchange water onto the stainless steel thin sheet. An alkaline solution for passivation treatment is sprayed onto the stainless steel thin sheet to passivation-treat the sheet. The alkaline solution for passivation treatment that is adhered to the stainless steel thin sheet is removed by spraying ion-exchange water onto the stainless steel thin sheet. The stainless steel thin sheet is then dried.

1. Amendment to Claim 5

Claim 5 has been amended to further recite that the washing water used in the "step of removing alkaline solution for cleaning..." is "mains water or industrial water." No new matter is added by this amendment since support is found throughout the present application and particularly at page 30, lines 6-10 and Figure 9.

Ohtani teaches that a stainless steel sheet is press-formed into a separator for use in a fuel cell and the press-formed separator is subjected to a passivation treatment. Fukui teaches that a metal material is press-formed while a lubricant is applied onto a surface of the metal material. Kovacs teaches that prior to a passivation treatment, a workpiece is washed with a solution containing a grease-removing agent, then immersed in an alkaline solution, and rinsed with water.

Kovacs further teaches that the passivation treatment is achieved using an alkaline solution of pH 12.

None of the cited references show or even suggest an alkaline solution removing step, which follows a lubricant removing step and which uses mains water or industrial water as washing water, as recited in amended claim 5. The mains water and industrial water are cheaper than ion-exchange water. Accordingly, by first rinsing the stainless steel thin sheet with the mains water or industrial water, followed by further rinsing of the stainless steel thin sheet with the ion-exchange water, it is possible to reduce the manufacturing cost (see page 30, lines 17-22 of the specification as filed). These features are not shown or taught by any of the cited references.

2. Additional Deficiencies of Present Rejection

The '077 document to Ohtani, although describing a method of manufacturing and passivating a fuel cell metallic separator; fails to teach, describe, or even suggest the particular method recited in claim 5. Instead, Ohtani describes using a grinding process in which a pressed metal blank is exposed to wet abrasive blasting.

Specifically, Ohtani fails to describe, teach, or even suggest the many features in claim 5 such as "a step of applying a lubricant to a stainless steel thin sheet and press-forming gas flow passages and cooling water flow passages in it." Ohtani also fails to describe, teach, or suggest "a step of removing lubricant adhered to the stainless steel thin sheet by spraying the press-formed stainless steel thin sheet with an alkaline solution for cleaning." Ohtani also fails to describe, teach, or suggest "a step of removing alkaline solution for cleaning adhered to the stainless

steel thin sheet by spraying washing water onto the stainless steel thin sheet." Ohtani also fails to describe, teach, or suggest "a step of removing washing water remaining on the stainless steel thin sheet by spraying ion-exchange water onto the stainless steel thin sheet."

Regarding passivation, although Ohtani describes performing such an operation, Ohtani actually employs an entirely different passivation procedure than that recited in the claims at issue. This is a clear example of teaching away from the claims at issue. Instead of using an "alkaline solution" as called for in the pending claims, Ohtani uses nitric (or nitride) acid, see paragraphs [0078] and [0092] of the '077 document. The problems of using nitric acid for passivation are described in the background section of the present application. The present invention provides a superior alternative to such known passivation methods.

Thus, Ohtani also fails to describe, teach, or suggest "a step of spraying an alkaline solution for passivation treatment onto the stainless steel thin sheet to passivation-treat the stainless steel thin sheet." And thus, it follows that Ohtani also fails to describe, teach, or suggest "a step of removing alkaline solution for passivation treatment adhered to the stainless steel thin sheet by spraying ion-exchange water onto the stainless steel thin sheet." And, as noted, Ohtani actually teach away from the claimed methods.

On page 9 of the most recent Office Action, the Examiner contended that:

> Applicant argues that Ohtani describes a grinding process and does not teach any of the claimed processing steps.
>
> The examiner does not find applicant's argument persuasive because the rejection ground for claims 5-8 are based on combined the teachings of Ohtani in view of Fukui and Kovacs and Ohtani is incorporated into the rejection ground due to its teaching of press forming a metallic plate into a separator having alternate ridges and grooves (i.e. separator with gas and water flow passages) and subsequent passivation.

Apparently, the Examiner recognizes the numerous failings of the '077 document to Ohtani, and so relies upon the collection of Fukui et al. and Kovacs et al. However, as explained below, neither of those patents, teach the particular operations recited in independent claim 5.

The '598 patent to Fukui fails to remedy the deficiencies of the '077 publication to Ohtani. Fukui fails to mention anything about passivating stainless steel surfaces. Instead, Fukui describes a separator for a fuel cell comprising a stainless steel substrate that has a collection of carbonaceous particles adhered to it in a certain distribution.

On page 9 of the most recent Office Action, the Examiner asserted that:

> Applicant further argues that Fukui does not teach anything about passivating stainless steel surface.
>
> The examiner does not find applicant's argument convincing since Fukui is incorporated into the rejection ground not for its teaching of passivating a stainless steel surface, but for its teaching of applying a lubricant during separator manufacturing process to improve workability during press forming.

It is respectfully submitted that although Fukui et al. describe pressing carbonaceous particles onto stainless steel sheets (see col. 3, lines 38-40), Fukui et al. fail to teach the many other operations recited in claim 5. Nor do Fukui et al. remedy the deficiencies of the '077 publication to Ohtani and/or the '663 patent to Kovacs et al.

Lastly, the '663 patent to Kovacs et al. also fails to remedy the numerous shortcomings of the combination of the '077 publication to Ohtani and the '598 patent to Fukui et al. Kovacs et al. entirely fail to teach an operation recited in claim 5 for "a step of removing washing water remaining on the stainless steel thin sheet by spraying ion-exchange water onto the stainless steel thin sheet." Moreover, Kovacs et al. entirely fail to teach another operation recited in claim 5, "a step of

spraying an alkaline solution...onto the stainless steel thin sheet...whereby a passivation film constituted by hydroxides produced from metal ions constituting the stainless steel thin sheet and hydroxide ions is formed." Instead, as previously explained herein, Kovacs et al. employ a different strategy utilizing a completely different series of reactions employing "non-aggressive oxyanions." The previously noted language in claim 5 expressly excludes the chemistry taught by Kovacs et al. Moreover, claim 5 also recites another operation that is not taught by Kovacs et al., "removing alkaline solution for passivation treatment adhered to the stainless steel thin sheet by spraying ion-exchange water onto the stainless steel thin sheet."

On page 9 of the most recent Office Action, the Examiner asserted that Applicant's previous explanations in support of patentability of claims 5-9 were considered. However, regarding the '663 patent to Kovacs et al., the Examiner contended that:

> The examiner does not find applicant's argument persuasive because none of the instant claims requires the presence of carbonate anions. In addition, instant claim 5 only requires that the passivation film constitute hydroxide ions, which is taught by Kovacs.

The Examiner is respectfully directed to independent claim 5 which recites in part, "whereby a passivation film constituted by hydroxides produced from metal ions constituting the stainless steel thin sheet and hydroxides is formed." It is respectfully submitted that it is not accurate to contend that claim 5 "only requires that the passivation film constitute hydroxide ions." No, as previously explained herein and as expressly called for in claim 5, a passivation film constituted by hydroxides "produced from metal ions constituting the stainless steel thin sheet and hydroxide ions is formed." Kovacs et al. entirely fail to teach or even suggest this particular passivation film.

For at least these reasons, it will be appreciated that Ohtani in view of Fukui, and further in view of Kovacs et al., are simply not relevant to the method recited in independent claim 5, particularly as now amended. Since independent claim 5 is believed to be patentable over the cited art, so too are claims 6-8, dependent therefrom.

D. Rejection of Claim 9 Under 35 USC §103 Based on the '077 Document to Ohtani in View of the '598 Patent to Fukui and the '633 Patent to Kovacs et al., and Further in View of US Patent 4,497,667 to Vashi Must be Withdrawn

Claim 9 recites in part, that the alkaline solution for cleaning is a solution made by adding a surfactant to a basic salt. However, claim 9 is dependent from previously discussed independent claim 5. And as previously explained, since claim 5 is distinguishable over the cited references to Ohtani, Fukui, and Kovacs et al., then the inquiry becomes whether the '667 patent to Vashi remedies the deficiencies of those references.

The '667 patent to Vashi is directed to a complex mixture of numerous components that forms a cleaning and conditioning solution. The purpose of Vashi's cleaning and conditioning solutions is actually opposite that of the present invention passivating solutions. Instead of forming a protective passivating layer on a metal substrate, as in claim 9 at issue, Vashi teaches that a cleaning and conditioning operation can be performed by applying the noted complex solution. "Conditioning," according to Vashi, refers to activating a surface and grain refining, see col. 1, lines 31-33. These operations are very different than forming a thin protective layer on a surface to prevent the surface from reacting or otherwise undergoing corrosion.

Thus, Vashi teaches away from claim 9. And clearly, Vashi does not remedy the deficiencies of the remaining references. "A prima facie case of obviousness can be rebutted if the applicant... can show 'that the art in any material respect taught away' from the claimed invention," *In re Haruna*, 249 F.3d 1327, 58 USPQ2d 1517 (Fed Cir 2001), citing *In re Geisler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed Cir. 1997).

On page 9 of the most recent Office action, the Examiner stated:

> Applicant argues that Vashi teaches away from claim 9 because it is directed to a cleaning and conditioning solution, not a passivation solution as claimed.
>
> The examiner does not find applicant does not find applicant's argument persuasive since the alkaline solution as recited in instant claim 9 is directed to the alkaline cleaning solution used prior to passivation, not the alkaline passivation solution. Vashi is incorporated into the rejection ground for its teaching of alkaline cleaning solution, not for passivation. Therefore, Vashi does not teach away from claim 9.

Although Vashi describe cleaning solutions, and claim 9 specifies a type of cleaning solution, the recited method at issue is the method of claim 5, from which claim 9 depends. It is claim 5 that recites a method for manufacturing a stainless steel separator for use in a fuel cell which comprises in part, a step of forming a particular passivation film which serves to prevent the surface from reacting or otherwise undergoing corrosion. Thus, if Vashi is relied upon for its teaching of cleaning solutions, it is even less relevant.

It is also respectfully submitted that the basis for the rejection of claim 9 is contrary to established precedent from the Court of Appeals for the Federal Circuit. That is, not only were a total of four (4) references cited, but apparently, only particular passages and select sentences from each were relied upon, i.e. "Fukui is incorporated into the rejection not for its teaching of passivating a stainless steel surface, but for its teaching of applying a lubricant during separator

manufacturing..." And, "Vashi is incorporated into the rejection ground for its teaching of alkaline cleaning solution, not for passivation."

This manner of selectively picking and choosing certain passages from a collection of references, using the claimed invention as a template, is a classic example of prohibited hindsight reconstruction (citations omitted).

Accordingly, it is respectfully submitted that none of the references taken singularly, or in any combination, teaches the subject matter of claim 9. Accordingly, it is submitted that claim 9 is patentable over the cited art.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SHM-15962.

Respectfully submitted,

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